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MONTGOMERY WATSON

4525 Wasatch Boulevard, Suite 200  
Salt Lake City, Utah 84124-4799

Tel: 801 272 1900

Fax: 801 272 0430

Date: August 29, 1996

To: Tim Brincefield, EPA-10

Fax Nos.: (206) 553-0124

From: Dean Pahl

Reference: 1183.0051

Subject: Transmittal of Response Re: Cost Estimate  
Issues

No. of Pages: 6 (incl. cover)

Phone No.: (206) 553-2100

The original: (✓) will not follow; OR ( ) will follow, by: [ ] U.S. Mail, [ ] overnight express.

Please find enclosed a memo and a revised cost estimate providing additional information in response to the recent issues we've discussed regarding a comment comparing costs at the Bunker Hill site to the Monsanto Soda Springs Plant. Based on our conversation Tuesday, I think the enclosed provides what you need to resolve the issue. As we discussed, I'd appreciate seeing the cost backup material you receive from the commenter. Please don't hesitate to call me or Bob Geddes if we can help further.

Thanks,

Dean Pahl

*If you do not receive all pages, or if there are any problems with this transmission, please call Nicole Sanovich at 801-272-1900.*

AR 2.1



**M E M O R A N D U M****MONTGOMERY WATSON**

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<b>To:</b>	Tim Brincefield, EPA-10 Bob Geddes, Monsanto	<b>Date:</b>	August 28, 1996
<b>From:</b>	Dean Pahl	<b>Job No.:</b>	1183.0051
<b>Subject:</b>	Transmittal of Revised Cost Estimate for Alternative 8 with a TCL of $3 \times 10^{-4}$ , Including Additional Detail on Soil Removal / Reuse		

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Please find enclosed a spreadsheet updating the FS cost estimate for Alternative 8 based on a TCL of  $3 \times 10^{-4}$ , and providing more detail of the cost elements associated with the removal and reuse of surficial off-site soils that are currently in agricultural or conservation set-aside use. Based on your voicemail messages and our conversation on Tuesday, August 27, the enclosed spreadsheet also briefly describes assumptions associated with removal/reuse and provides specific references to the cost estimating source used. Please carefully consider the specific cost elements and assumptions that roll up into the unit costs that were questioned in the EPA comment, as it may be that a comparison between crabapples and watermelons was attempted. If you are unable to answer the questions from the enclosed information, Montgomery Watson and/or Monsanto would be happy to assist more directly in resolving your concerns (through meeting or teleconference with you and others, as appropriate). We are confident that the cost estimates are sound and reasonable, within the methodology and precision intended for an FS.

Since receiving your initial call, I have taken the opportunity to confirm the methodology and the reasonableness of the removal/reuse unit costs within Montgomery Watson and Monsanto. For example, Monsanto is actively involved in another CERCLA site remediation in Texas for which the "as-built" soil replacement costs are \$12/cy in a situation where borrow material is available nearby and soil quality requirements are equal or lower than for the agricultural land adjacent to the Soda Springs site. My inquiries in Utah and Idaho on these costs leave me with the belief that these specific unit costs may tend to under-, but not over-estimate what may be required to implement this type of remedy. Questioning an individual element of a preliminary engineering cost estimate based on "local" cost data needs to be carefully evaluated, since both over- and under-estimates at the individual line level will occur as a project is designed and implemented; this is the reason for the use of contingency and/or precision qualifications to this level of estimate. Please recall that all of the individual cost estimates for the alternatives evaluated are built from comparable methodology, and are intended to carry a -30- to +50-percent precision, as would normally be associated with such preliminary estimates. Should similar concerns be emphasized as part of the decision process, we should probably reconsider the other relevant cost estimates and elements for fairness and comparability — even though the FS has, of course, already been approved following appropriate peer and agency review.

Please feel free to contact me or Bob Geddes at Monsanto if we can provide any further help to resolve your concerns.

8/29/96

**MONSANTO SODA SPRINGS PLANT  
COST ESTIMATE FOR ALTERNATIVE 8 REVISED TO A TCL OF 3 E -04**

Item/Description	Estimated Quantity	Units	Unit Cost (\$)	Total Cost (\$)
<b>DIRECT CAPITAL COST (DCC)</b>				
<b>General</b>				
Mobilization/Demobilization	1	Lump Sum	\$5,000	\$5,000
Work Plan Preparation	1	Lump Sum	\$10,000	\$10,000
<b>Dust Suppressant (Stockpiles)</b>				
Material and Application <sup>a</sup>	33	Acre	\$2,000	\$66,000
<b>Access Restrictions</b>				
Fencing Materials & Installation <sup>b</sup>	0	Linear Ft.	\$12	\$0
Other Land Use/Access Restrictions <sup>c</sup>	1	Lump Sum	\$50,000	\$50,000
Groundwater Land Use/Access Restrictions	1	Lump Sum	\$20,000	\$20,000
<b>Water Supply Ordinance</b>				
<b>Removal/Reuse (Off-Site Soils)</b>				
* Removal of Contaminated Soils	201,667	Cubic Yd.	\$10	\$2,016,667
* Clean Fill	201,667	Cubic Yd.	\$15	\$3,025,000
Reseeding	250	Acre	\$150	\$37,500
Subtotal - DIRECT CAPITAL COST (DCC)				\$5,230,167
<b>INDIRECT CAPITAL COST (ICC)</b>				
Contractor Bonding (Dust Suppressant and Removal/Disposal)	2	% DCC		\$102,903
Engineering Design (Dust Suppressant and Removal/Disposal)	8	% DCC		\$411,613
Construction Oversight (Dust Suppressant and Removal/Disposal)	5	% DCC		\$257,258
Administrative Costs	4	% DCC		\$209,207
Subtotal - INDIRECT CAPITAL COST (ICC)				\$980,982
Contingency	30	% (DCC+ICC)		\$1,863,345
<b>TOTAL CAPITAL COST</b>				<b>\$8,074,493</b>
<b>ANNUAL OPERATION AND MAINTENANCE (O&amp;M) COST</b>				
<b>Groundwater Monitoring Program</b>				
Monitoring Well and Spring Sampling <sup>d</sup>	25	Sample Point	\$1,500	\$37,500
Analytical Lab Testing <sup>e</sup>	30	Sample	\$250	\$7,500
Data QA/QC and Reporting	1	Lump sum	\$20,000	\$20,000
<b>Dust Suppressant (Stockpiles)</b>				
Material and Application <sup>a</sup>	33	Acre	\$2,000	\$66,000
<b>Fence Maintenance</b>				
Repairs	0	Lump Sum	\$3,000	\$0
Subtotal - ANNUAL O&M COST (O&MC)				\$131,000
Administrative Costs		2 % O&MC		\$2,620
Contingency		20 % O&MC		\$26,200
<b>TOTAL ANNUAL O&amp;M COST</b>				<b>\$159,820</b>

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**MONSANTO SODA SPRINGS PLANT  
COST ESTIMATE FOR ALTERNATIVE 8 REVISED TO A TCL OF 3 E -04**

Item/Description	Estimated Quantity	Units	Unit Cost (\$)	Total Cost (\$)
<b>FIVE-YEAR SITE REVIEW</b>				
Site Review Assessment and Report	1	Lump Sum	\$15,000	\$15,000
		Subtotal - FIVE-YEAR SITE REVIEW COST (FYC)		\$15,000
Contingency			30 % FYC	\$4,500
		<b>TOTAL COST OF FIVE-YEAR REVIEW</b>		<b>\$19,500</b>

**PRESENT WORTH**

Interest Rate 7%  
Years 30

**TOTAL PRESENT WORTH** **\$10,080,000**

Itemized costs are rounded up to the nearest \$100. Total present worth is rounded to 2 or 3 significant figures. O & M costs for dust suppressant and groundwater monitoring are extended to 30 years.

- \* Additional detail for removal and replacement of off-site soils is provided on page 4/4.
- a Assumes dust suppressant applied to UFS area on an annual basis.
- b Assumes fenced area is limited to off-site areas where concentrations exceed target cleanup goals, as shown in Figure 3-1.
- c Land use restrictions include a deed restriction which will state that residential development of the site will require the mitigation of Radon build-up in basements.
- d Assumes sampling crew is a two-person team, two wells sampled per day.  
Cost includes equipment rental, labor, per diem, mob/demob. Assumes purge water discharged on-site.
- e Groundwater samples analyzed for cadmium, fluoride, nitrate, selenium, and manganese. Assumes 5 QA/QC samples per round.

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**MONSANTO SODA SPRINGS PLANT  
COST ESTIMATE FOR ALTERNATIVE 8 REVISED TO A TCL OF 3 E -04**

YEAR	CAPITAL COSTS	O&M and VIEW COST (FY	ANNUAL EXPENDITURE		DISCOUNT FACTOR	PRESENT WORTH
0	\$8,074,493	\$0	\$8,074,493		1.00	\$8,074,493
1	\$0	\$159,820	\$159,820		0.93	\$149,364
2	\$0	\$159,820	\$159,820		0.87	\$139,593
3	\$0	\$159,820	\$159,820		0.82	\$130,461
4	\$0	\$159,820	\$159,820		0.76	\$121,926
5	\$0	\$179,320	\$179,320		0.71	\$127,853
6	\$0	\$159,820	\$159,820		0.67	\$106,495
7	\$0	\$159,820	\$159,820		0.62	\$99,528
8	\$0	\$159,820	\$159,820		0.58	\$93,017
9	\$0	\$159,820	\$159,820		0.54	\$86,931
10	\$0	\$179,320	\$179,320		0.51	\$91,157
11	\$0	\$159,820	\$159,820		0.48	\$75,929
12	\$0	\$159,820	\$159,820		0.44	\$70,962
13	\$0	\$159,820	\$159,820		0.41	\$66,320
14	\$0	\$159,820	\$159,820		0.39	\$61,981
15	\$0	\$179,320	\$179,320		0.36	\$64,994
16	\$0	\$159,820	\$159,820		0.34	\$54,137
17	\$0	\$159,820	\$159,820		0.32	\$50,595
18	\$0	\$159,820	\$159,820		0.30	\$47,285
19	\$0	\$159,820	\$159,820		0.28	\$44,192
20	\$0	\$179,320	\$179,320		0.26	\$46,340
21	\$0	\$159,820	\$159,820		0.24	\$38,599
22	\$0	\$159,820	\$159,820		0.23	\$36,073
23	\$0	\$159,820	\$159,820		0.21	\$33,714
24	\$0	\$159,820	\$159,820		0.20	\$31,508
25	\$0	\$179,320	\$179,320		0.18	\$33,040
26	\$0	\$159,820	\$159,820		0.17	\$27,520
27	\$0	\$159,820	\$159,820		0.16	\$25,720
28	\$0	\$159,820	\$159,820		0.15	\$24,037
29	\$0	\$159,820	\$159,820		0.14	\$22,465

**30-YEAR TOTAL PRESENT WORTH** **\$10,076,226**

8/29/96

**MONSANTO SODA SPRINGS PLANT  
COST ESTIMATE FOR ALTERNATIVE 8 REVISED TO A TCL OF 3 E -04**

**ASSUMPTIONS AND BASIS FOR UNIT COSTS USED FOR REMOVAL AND REPLACEMENT OF  
SURFACE OFF-SITE SOILS**

Primary source: 1995 Means Construction Cost Data, R.S.Means Company, 53 ed.]

**General assumptions:**

At a target cleanup level of 3 E -04, 244 acres of soil (say 250 acres) are affected by Ra-226, as determined from straight interpolation from appropriate, available data from the RI (11 primary data points used). A figure has been prepared separate from the FS to represent the affected area.

Where the unit is acres in Means 1995, a conversion has been made to CY for consistency, assuming a 6-in. depth as appropriate.

Cost Element	Means Reference	Unit Cost Range		Units
		Low	High	
Cost elements for estimation of unit cost for "removal of contaminated soils":				
Clear and grub, light to medium	021-108-300/400	\$0.92	\$1.23	CY
Excavation, with scraper, 1500-ft haul	022-246-300/2300	\$2.50	\$2.75	CY
Haul with dump truck, 1 mile RT	022-266-1150/040	\$2.03	\$3.88	CY
Backfill with dozer, ≤300-ft haul, no compaction	022-204-1600	\$1.13	\$1.13	CY
Compaction	022-222-0300	\$0.69	\$0.79	CY
	Subtotal	\$7.27	\$9.78	CY

Add. cost for soil sample collection and analysis, for delineation and confirmation.

* Use	\$10.00	CY
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**Cost elements for estimation of replacement of 6 inches of topsoil:**

Topsoil, furnish, 5-mi. haul, and dump	022-212-200/800	\$11.92	\$26.02	CY
[Note range of price is between common borrow and screened loam; topsoil for agricultural use should fall in this range]				
Spread and rough grade	022-286/0400	\$3.97	\$3.97	CY
Subtotal		\$15.89	\$29.99	CY

* Use	\$15.00	CY
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**Comments:**

- 1 This estimate assumes that surficial soil is removed from affected land owned by others and replaced, without compensation to the landowner (other Alternatives assume costs for acquisition or for compensation for lost crop yield). This assumption may lead to an underestimation.
- 2 Distances assumed are conservative (tend to underestimate).
- 3 The cost elements contributing to the "removal of contaminated soils" cost item assume that surficial soil is scraped, staged, transported into the Plant, spread for cover such as for the slag pile or stockpiles, and compacted.
- 4 This estimate assumes that topsoil is shallow in this area (per conversation with the Soil Conservation Service), and that all topsoil that is removed must be replaced with equal or better material to support agricultural use. If an alternate approach were practicable and used, cost for compensation to the landowner would probably be necessary and should be factored into the estimate.
- 5 The range of costs from Means 1995 used here to represent topsoil assumes local material would be available in the required quantity. This is improbable, and this cost estimate is conservative (is probably significantly underestimated). Importing of distant borrow material, purchase of land as a borrow source, or soil amendment to create acceptable material, if feasible as alternatives, would increase costs.
- 6 Reevaluation of the removal/reuse cost element indicates that reseed costs may be underestimated.